New claims

1. Method for controlling the operation of an electronic wheel unit (2) assigned to a vehicle wheel (1), comprising the following steps:

Acquiring data in respect of the operating state of the wheel (1) by means of at least one state detection device (3);

Acquiring data in respect of the energy instantaneously available to the electronic wheel unit (2) from a generator (5) and from an energy storage device (6) by means of at least one energy detection device (4, 4');

Controlling the operation the electronic wheel unit (2) and the thereby determined energy consumption of the electronic wheel unit (2) as a function of the data acquired by the at least one state detection device (3) and the at least one energy detection device (4, 4') by means of a central control unit (9) connected to the at least one state detection device (3) and to the at least one energy detection device (4, 4'); and

Ensuring a functionality of the electronic wheel unit (2) during predetermined important operating states of the wheel (1) that at least temporarily consumes more energy than is instantaneously available from the generator (5), and a functionality of the electronic wheel unit (2) during predetermined less important operating states of the wheel (1) that is reduced below the degree available from the available energy of the generator (5), in order that the generator (5) charges up the energy storage device (6) to

compensate for energy previously over-consumed or to be over-consumed.

2. Method according to claim 1,
characterized in that the electronic wheel unit (2) is directly connected to the energy storage device (6) for supplying it with energy.

3. Method according to claim 1 or 2,
characterized in that the energy storage device (6) is disposed between the generator (5) and the electronic wheel unit (2).

4. Method according to at least one of the preceding claims,
characterized in that the energy storage device (6) is implemented using charging electronics (7) for suitable conversion and conditioning of the signals received from the generator (5).

5. Method according to at least one of the preceding claims,
characterized in that the energy storage device (6) is implemented as a rechargeable battery, capacitor, gold cap capacitor, a foil battery incorporated in a circuit board, or the like.

6. Method according to at least one of the preceding claims,
characterized in that there are provided a plurality of state detection devices (3) for acquiring data in respect of accelerations, vibrations, noise, forces, movements, temperatures, pressures, etc. of the associated wheel (1).

7. Method according to at least one of the preceding claims,
characterized in that there are provided a plurality of energy detection devices (4, 4') for detecting the instantaneously available energy of the generator (5) and the instantaneous utilization state of the energy storage device (6).

8. Method according to at least one of the preceding claims,
characterized in that the central control unit (9) receives and evaluates data in respect of the following operating states from the at least one state detection device (3) and/or the at least one energy detection device (4, 4'): start of driving, e.g. a defined time interval after moving off; initialization, whereby an initialization procedure is executed e.g. on the vehicle receiver; localization, whereby a localization procedure is executed e.g. on the vehicle receiver; a risk state, e.g. for a below-threshold pressure and/or an above-threshold speed of a wheel (1); a danger state, e.g. for greatly below-threshold pressure of the wheel (1); charging state of the energy system, e.g. for high available energy at the output of the generator (5) and/or a low fill level of the energy storage device; or the like.

9. Method according to at least one of the preceding claims,
characterized in that the central control unit (9) controls the following responses of the electronic wheel unit (2) as a function of the acquired data: the transmitting frequency of the electronic wheel unit (2); the measurement frequency

of the electronic wheel unit (2); the repetition frequency of a radio telegram to improve transmission reliability; the accuracy of the measurements of the electronic wheel unit (2); selecting which measurements are to be performed by the electronic wheel unit (2); transition to or from a power saving mode of the electronic wheel unit (2); connection of the electronic wheel unit (2) to the energy storage device (6); adaptation or selection of the transmitted data, e.g. the telegram is reduced to the most necessary core data for energy saving (only identifiers and possibly additional pressure and temperature data), whereas without the need to save energy all the sensor data together with calibration and manufacturing data is transmitted; or the like.

10. Method according to at least one of the preceding claims,
characterized in that the central control unit (9) is connected to the electronic wheel unit (2) via a radio link.

11. Method according to at least one of the preceding claims,
characterized in that the plurality of state detection devices (3) and/or the plurality of energy detection devices (4, 4') are implemented as passively operated sensors.

12. Method according to at least one of the preceding claims,
characterized in that the generator (5) is implemented as an energy transducer.

13. Apparatus for controlling the operation of an electronic wheel unit (2) assigned to a vehicle wheel (1) with:

at least one state detection device (3) for acquiring data in respect of the operating state of the wheel (1);

at least one energy detection device (4, 4') for acquiring data in respect of the energy instantaneously available to the electronic wheel unit (2) from a generator (5) and from an energy storage device (6); and with

a central control unit connected to the at least one state detection device (3) and to the at least one energy detection device (4, 4') for controlling the operation of the electronic wheel unit (2) and the thereby determined energy consumption of the electronic wheel unit (2) as a function of the data acquired by the at least one state detection device (3) and the at least one energy detection device (4, 4');

wherein during predetermined important operating states of the wheel (1) the central control unit (9) ensures a functionality of the electronic wheel unit (2) which at least temporarily consumes more energy than is instantaneously available from the generator (5) and, during predetermined less important operating states of the wheel (1), reduces the functionality to below the degree available from the available energy of the generator (5) in order that the generator (5) charges up the energy storage device (6) to compensate for the energy previously over-consumed or to be over-consumed.

14. Apparatus according to claim 13,

characterized in that the electronic wheel unit (2) is connected directly to the energy storage device (6) for supplying energy.

15. Apparatus according to claim 13 or 14, characterized in that the energy storage device (6) is disposed between the generator (5) and the electronic wheel unit (2).

16. Apparatus according to at least one of claims 13 to 15, characterized in that the energy storage device (6) is implemented with charging electronics (7) for appropriate conversion and conditioning and the signals received by the generator (5).

17. Apparatus according to at least one of claims 13 to 16, characterized in that the energy storage device (6) is implemented as a rechargeable battery, capacitor, gold cap capacitor, a foil battery incorporated in a circuit board, or the like.

18. Apparatus according to at least one of claims 13 to 17, characterized in there are provided a plurality of state detection devices (3) for acquiring data in respect of accelerations, vibrations, noise, forces, movements, temperatures, pressures, etc. of the associated wheel (1).

19. Apparatus according to at least one of claims 13 to 18, characterized in that there are provided a plurality of energy detection devices (4, 4') for detecting the instantaneously available energy of the generator (5) and the instantaneous utilization state of the energy storage device (6).

20. Apparatus according to at least one of claims 13 to 19, characterized in that the central control unit (9) receives and evaluates data in respect of the following operating states from the at least one state detection device (3) and/or the at least one energy detection device (4, 4'): start of driving, e.g. a defined time interval after moving off; initialization, whereby an initialization procedure is executed e.g. on the vehicle receiver; localization, whereby a localization procedure is executed e.g. on the vehicle receiver; a risk state, e.g. for a below-threshold pressure and/or an above-threshold speed of a wheel (1); a danger state, e.g. for greatly below-threshold pressure of the wheel (1); charging state of the energy system, e.g. for high available energy at the output of the generator (5) and/or a low fill level of the energy storage device; or the like.

21. Apparatus according to at least one of claims 13 to 20, characterized in that the central control unit (9) controls the following responses of the electronic wheel unit (2) as a function of the acquired data: the transmitting frequency of the electronic wheel unit (2); the measurement frequency of the electronic wheel unit (2); the repetition frequency of a radio telegram to improve transmission reliability; the accuracy of the measurements of the electronic wheel unit (2); selecting which measurements are to be performed by the electronic wheel unit (2); transition to or from a power saving mode of the electronic wheel unit (2); connection of the electronic wheel unit (2) to the energy storage device (6); adaptation or selection of the transmitted data, e.g. the telegram is reduced to the most necessary core data for energy saving (only identifiers and possibly additional

pressure and temperature data), whereas without the need to save energy all the sensor data together with calibration and manufacturing data is transmitted; or the like.

22. Apparatus according to at least one of claims 13 to 21, characterized in that the central control unit (9) is connected to the electronic wheel unit (2) via a radio link.

23. Apparatus according to at least one of claims 13 to 22, characterized in that the plurality of state detection devices (3) and/or the plurality of energy detection devices (4, 4') are implemented as passively operated sensors.

24. Apparatus according to at least one of claims 13 to 24, characterized in that the generator (5) is implemented as an energy transducer.